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[Reprinted from the Boston Medical and Surgical Journal
of June 23, 1898.]

A CONSIDERATION OF THE PROFESSOR GÆRTNER-MOTHER-MILK.¹

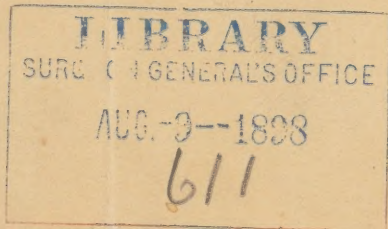
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THIS latest addition to the innumerable lists of the so-called infant foods has been used in Germany since 1894, but was not introduced into this country until 1897, when a factory for its production was established in Orange County, New York.

The method of its preparation, as described by Gærtner, is as follows: Equal parts of cows' milk and sterilized water are placed in a Pfanhauer centrifuge, which makes from 4,000 to 8,000 revolutions per minute. This separator consists essentially of a steel drum which revolves on its axis. The mixture is separated into a lighter inner portion (the "fat milk") and a heavier outer portion (the "skim milk"). These are then drawn off separately in equal portions. It is evident that the percentages of fat, sugar, proteids and ash in the mixture of milk and water put in the centrifuge are just half those of the original milk. It is claimed that by the process of centrifugalization practically all of the fat is driven into the inner portion, while the other constituents remain, as before, evenly distributed throughout the mixture; that is, the inner layer, or "fat milk," contains all but one-tenth or

¹ Read before the Clinical Section of the Suffolk District Medical Society, January 19, 1898.

presented by
the author



two-tenths per cent. of the fat and half the proteids, sugar and salts of the milk, while the outer layer, or "skim milk," contains only one-tenth or two-tenths per cent. of the fat and half the proteids, sugar and salts of the milk. The outer layer also contains the extraneous matter. The above statements must be, I think, accepted as essentially correct.

The inner layer, or "fat milk," forms the basis of the food. It is claimed that the percentages of fat and proteids thus obtained are identical with those in healthy human milk. As the percentage of sugar is much lower than that in human milk, enough milk-sugar is added to give the proper proportion. As the reaction of this food is alkaline, while that of cows' milk is acid, an alkali must also be added. Nothing is said about this, however, and I do not know the nature of the alkali. The food is sterilized and sold in "hermetically sealed" tin cans containing a third of a litre, or about ten ounces.

The following are some of the claims made for this food: "It is identical in appearance, taste and analysis with healthy breast milk."

"The fat is not separated from the cows' milk, but remains in its original natural emulsion."

"It is thoroughly sterilized and will remain pure and sweet for an indefinite time in almost any temperature."

"It is cheap relatively to its value as a food, and there is no waste in using it."

To substantiate the claim that the analysis of the Gærtner-Mother-Milk is identical with that of healthy breast milk the following table is given —

	Fat.	Casein.	Salts.	Sugar.
Human milk	3.10	1.55	.25	6.20
Gærtner milk	3.10	1.55	.25	6.20

This can be accepted only as a correct comparison of certain human milks with certain samples of Gärtner milk, and not as a general rule. It is evident from the process of manufacture that the percentages of fat and proteids in the "Mother-Milk" must vary directly with those of the cows' milk used. The percentages of these substances in cows' milk are not constant, however, but vary. The average analyses as given by various authors are as follows :

	Fat.	Proteids.
Rotch	4.00	4.00
Holt	3.50	4.00
Baginsky	3.40	3.50
Professor Gärtner-Mother-Milk circular	2.50	3.60

In making comparisons, Gärtner seems to have as a rule adopted Baginsky's formula, probably because it contains lower proteids. The percentages of fat and proteid in the Gärtner-Mother-Milk cannot, therefore, be constant. That this is so is shown by various published analyses.

	Fat.	Proteids.
Professor Gärtner-Mother-Milk circular	3.10	1.55
Professor Gärtner-Mother-Milk circular	3.10	1.70
Escherich (average of 24 exams.) . .	3.00	1.76
Poole	3.05	2.09

In the comparative table of the Professor Gärtner-Mother-Milk circular the percentages of human milk are given as if constant: fat, 3.10; proteids, 1.55. This is not so, however, as the figures below show :

	Fat.	Proteids.
Professor Gärtner-Mother-Milk circular	3.10	1.55
Professor Gärtner-Mother-Milk circular	3.10	1.70
Holt	4.00	1.50
Rotch	3.00-4.00	1.00-2.00
Adrianse	3.83	.83-1.70
Pfeiffer	3.10	1.94

For purposes of comparison Gärtner seems to have

followed Pfeiffer, probably because he gives low fat. It is evident, therefore, from the above tables that while the proportions of fat and proteids in various specimens of Gärtner-Mother-Milk are the same as those in various specimens of human milk, the percentage of fat is, on the whole, lower and that of the proteids higher than in human milk. The food is unsatisfactory, however, because it is inconstant and because there is no means of knowing the composition of any individual specimen. Moreover, it is insusceptible of modification to suit individual cases. These are very serious defects.

The statement is made that "the fat is not separated from the cows' milk but remains in its original natural emulsion." I am not prepared to contradict this. Poole, however, states that "when cold, part of the fat separates out, forming a layer on top of the liquid." The directions on the can — "Place the can in hot water from three to five minutes and shake well before opening it" — seem to verify this statement.

There is no doubt, I think, that the milk "will remain pure and sweet for an indefinite time in almost any temperature." This can be attained in one of two ways — by the addition of chemicals or by sterilization. It is claimed that nothing is added to the milk, but that "it is thoroughly sterilized." Sterilization to fulfil the above conditions must be at 212° on at least two successive days. Sterilization at this temperature is supposed to cause chemical changes in the proteids which render them less suitable for the infant digestion. It also deprives the milk of the quality commonly known as "freshness," and thus places it in the class of foods whose use is at times associated with scurvy.

The retail price given in the company's circular is fifteen cents a can or \$1.50 a dozen. The retail price

given me at Weeks & Potter's, the Boston agents, was twenty-five cents a can or \$2.50 a dozen. A can holds about ten ounces. A baby a month old would use about two cans a day, costing twenty-five cents or more a day; and one eight months old, five cans a day, costing sixty cents or more a day. At this rate it is certainly not a cheap food but a rather expensive one. The average cost of a properly modified milk from a milk laboratory is no greater, and that of modified milk prepared at home much less. These milks, moreover, can be varied to suit the age and individual.

CONCLUSIONS.

The Professor Gærtner-Mother-Milk contains only the constituents of cows' milk. These constituents are present in approximately the same proportions as in human milk. The proportions, however, are not constant and are unknown to the consumer. These proportions are insusceptible of modification. It is not a fresh food. It costs as much or more than modified milk which is freshly prepared and whose proportions can be varied.

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